DEPARTMENT OF THE ARMY
U.S. ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL
AND FORT SAM HOUSTON
Fort Sam Houston, Texas 78234-5014

FSH Memorandum
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Safety

RESPIRATORY PROTECTION PROGRAM

1. PURPOSE. To establish the Respiratory Protection Program for Fort Sam Houston (FSH). It encompasses the use and maintenance of respiratory protective equipment required to work safely in environments where respiratory protection is necessary.

2. APPLICABILITY. This memorandum applies to all military, civilian and contracting personnel assigned or attached to FSH, to include Camp Bullis. An exception is Brooke Army Medical Center (BAMC), based on potential exposures to Tuberculosis. Brooke Army Medical Center, will establish their own program, designate an administrator, and perform fit-testing.

3. REFERENCES.

a. AR 40-5, Preventive Medicine.

b. TB MED 502, Respiratory Protection.

c. AR 11-4, Respiratory Protection Program.

d. Occupational Safety and Health Administration (OSHA) Standard, 29 CFR, Subpart I (Section 1910.134 and 1910.139).

4. BACKGROUND. It is recognized that respiratory protection is a form of personal protective equipment, and its use is the least desirable control mechanism within the hierarchy of controls. However, when working in the field environment, respiratory protection is often required, and represents an effective mechanism to control exposures. This program is in accordance with 29 CFR, section 1910.134, Respiratory Protection, and section 1910.139, Respiratory Protection for M. Tuberculosis, as amended in the Federal Register, January 8, 1998. In some instances, it may be more stringent than the standard requires, thus providing greater protection.

5. RESPONSIBILITIES.

a. Occupational Safety and Health (OSH) Manager. The OSH manager serves as the Respiratory Protection Program administrator for FSH. The administrator has been designated to be responsible for the Respiratory Protection Program, and has the authority to make decisions and implement changes whenever they are needed. Specific responsibilities include:

(1) Establish guidelines for respirator selection.

(2) Determine training requirements of employees identified to wear respirators.

(3) Ensure medical screening has occurred prior to respirator assignment.

(4) Designate policies concerning storage, maintenance, cleaning, and repair of respirators.

b. Installation Safety Office (ISO).

(1) Assist supervisors in identifying respirator usage requirements.

(2) Monitor the use of respirators in the field.

(3) Provide initial training.

(4) Assist in providing workplace specific, and refresher training.

(5) Conduct qualitative or quantitative fit-testing.

(6) Maintain a data base of respirator users.

c. Installation Medical Authority (IMA)/Preventive Medicine Service.

(1) Monitor the use of respirators in the field.

(2) Assist in providing training.

(3) Assist in respirator selection.

(4) Sample for potential air contamination and designate respirator usage based on the results.

(5) Perform medical evaluations to determine an employees ability to use respirators.

(6) Submit "Medical Clearance" paperwork to the ISO prior to an individual being fit-tested.

(7) Provide ongoing medical surveillance (Occupational Health Clinic), as appropriate.

d. Supervisors.

(1) Identify locations where potential exposures to atmospheres may require respiratory protection.

(2) Coordinate with Preventive Medicine personnel, to measure potential air contamination at the identified locations.

(3) Identify personnel who require the use of respiratory protection through job knowledge/task/descriptions, and schedule appointments for medical evaluations with Occupational Health.

(4) Coordinate with the Safety Officer (SO) to select the proper respiratory protection.

(5) Schedule training and qualitative "Respirator Fit- Testing" for personnel who require the use of respiratory protection.

(6) Monitor the use of respirators.

(7) Certify the use of the respiratory protection as personal protective equipment, and record training on FSH Form 98-E, Employee Safety and Health Training Record.

(8) Contract for quantitative fit-testing and Self Contained Breathing Apparatus (SCBA) training, if required.

(9) Contract for the testing of the air used for Supplied Air Respirators.

e. Collateral Duty Safety Officers (CDSO) and Fire/Safety Monitors.

(1) Assist supervisors in carrying out their responsibilities.

(2) Coordinate with the ISO for training, monitoring, and selection of respiratory protection.

f. Medical Command (MEDCOM), Contracting Center. Ensures all contracts which necessitate the use of respiratory protection contain verbiage requiring the contractor to have a Respiratory Protection Program in accordance with (IAW) OSHA 29 CFR, section 1910.134 and section 1910.139, as appropriate.

g. Contractors. Provide documentation to the Contracting Officer's Representative (COR) of a fully operational Respiratory Protection Program, if their work requires the use of respiratory protection. This documentation will be provided and reviewed prior to the start of work.

6. TRAINING.

a. All FSH employees will receive respiratory protection training prior to working in areas where respiratory protective equipment is required. Areas covered during employee training will include the subjects listed below:

(1) Nature of work, including hazard identification.

(2) Selection and wearing of respirators.

(3) Inspection and maintenance of respirators.

(4) Cleaning, disinfecting and storage of respirators.

(5) Precautions and limitations when using respirators.

(6) Leak test procedures (function checks).

b. Once the training is completed, the supervisor will enter the pertinent information on FSH Form 98-E. A record of all personnel on the Respiratory Protection Program will be maintained by the ISO, to include the date of training, and date of fit-testing. If training is provided by someone other than the ISO, a list of attendees will be forwarded to the Directorate of Public Safety (DPS), ATTN: MCGA-DPS-S.

7. OPERATING PROCEDURES.

a. Respirator selection.

(1) All respirators will be selected according to the nature of the hazard, and the level of control required. All respirator components will be approved by the National Institute of Occupational Safety and Health (NIOSH) and bear the approval number.

(2) The Department of Defense (DOD), Department of the Army (DA), OSHA, and various respirator manufacturers agree that a proper face seal cannot be achieved with the presence of facial hair. Therefore, respirator users will not be allowed to have beards, sideburns or other facial hair growth that will interfere with the face to respirator seal.

(3) All respirators leak. Based on the average leakage, during laboratory testing for NIOSH certification for approval of the various types of respiratory protection, a protection factor is assigned. The protection factor is defined as the concentration of the contaminant outside respirator divided by the concentration inside. The protection factor is important when selecting the proper respiratory protection, based on either the measured (actual) or potential contaminant concentration.

b. Appendix A, Respiratory Protection Selection Criteria, contains general respiratory protection criteria, while appendix B, Potential Hazards and Associated Respiratory Protection at FSH, contains a compilation of specific hazards that FSH employees may encounter, which requires the use of respirators. Appendix A, describes the nine separate filter categories for particulate respirators as indicated by NIOSH, and promulgated by 42 CFR 84. Appendix B, will be updated as additional hazards requiring respiratory protection are identified or previously identified hazards are eliminated.

c. Respirator assignment.

(1) Each individual will be assigned his/her own respirator. Prior to receiving a respirator, each individual will receive a qualitative fit test by the ISO. The fit test will be repeated annually unless a specific OSHA regulation dictates otherwise (e.g., 29 CFR 1926.62 and 1926.1101 -- lead and asbestos, respectively, every 6 months) or whenever one of the following conditions occur:

(a) Weight loss or gain of 20 pounds.

(b) New use of dentures or other significant dental changes.

(c) Broken nose or other facial accident/scarring.

(d) Reconstructive or cosmetic surgery.

(e) Pregnancy.

(f) Any other conditions which may affect the fit.

(2) After each fit test, a copy of the fit test record will be completed and given to the supervisor who maintains the employee's FSH Form 98-E.

d. Appendix C, Fit Testing, depicts the qualitative fit testing procedure, while appendix D, Qualitative Respirator Fit Test Record, contains a copy of the fit test material.

e. Respirator function checks. All employees using negative pressure respirators will perform positive and negative function checks each time they don the respirator. The purpose is to ensure a good face-to-facepiece (or respirator) seal, and that excess leakage does not occur. The specific methodology will depend on the type of respirator, and will be taught during the training sessions. The procedure will be repeated until a successful face-to-facepiece is obtained.

f. Cleaning and inspection.

(1) Each individual assigned a respirator is responsible for cleaning his/her respirator according to the procedures presented in the training. The

individual is also responsible for properly maintaining the respirator, to insure it is always suitable for use. If repairs or replacements are needed, personnel should immediately notify their immediate on-site supervisor. A respirator that fails the inspection shall never be used.

(2) Inspection and general cleaning guidelines are at appendix E and F, respectively.

g. Storage.

(1) Respirators will be stored in a clean dry location, and away from chemicals.

(2) They will not be left loose in the work location, shoved into a pocket, hung on a door hook, kept in an automobile.

(3) They will be stored in zip-lock bags or other air tight containers.

(4) Single use respirators will be discarded after use.

h. Disposal.

(1) Do not indiscriminately dispose of respirator cartridges/filters into the regular trash.

(2) All single use respirators and cartridges/filters used in association with the protection from microorganisms will be disposed of into properly labeled regulated medical waste containers.

(3) The disposal of the cartridges/filters used with certain contaminants, such as lead and asbestos, must be disposed of as hazardous and special wastes, respectively.

i. Medical surveillance. Before anyone is assigned a respirator, he/she will receive an appropriate medical examination in accordance with 29 CFR 1910.134. The physician must certify that the individual is medically fit,

and can wear a respirator. Until the individual is relieved of his duties, he/she will remain in the installation's medical surveillance program, as appropriate.

APPENDIX A
RESPIRATORY PROTECTION SELECTION CRITERIA

1. The appropriate OSHA criteria will be used for selecting respiratory protection. The specific requirements will be either based on air monitoring or as described in specific sections of the OSHA regulations, such as 29 CFR, section 1910.1001, Asbestos.

2. The DOD, DA, OSHA, NIOSH, and various respirator manufacturers agree that a proper face seal cannot be achieved with the presence of facial hair. Therefore, respirator users will not be allowed to have beards, sideburns, or other facial hair growth that will interfere with the face to the respirator seal.

3. All respirators leak. Based on the average leakage during laboratory testing for NIOSH certification or approval of the various types of respiratory protection, a protection factor is assigned. The protection factor is defined as the concentration of the contaminant outside respirator divided by the concentration inside. The protection factor is important when selecting the proper respiratory protection based on either the measured (actual) or potential contaminant concentration. For example, if a respirator has a protection factor of 10 (such as a half-mask), it is anticipated that a leakage up to 10 percent could occur. If the 10 percent level of the concentration is greater than the Permissible Exposure Limit, a respirator with a greater protection would be required.

4. There are two major categories of respirators. Air purifying (filtering) and air supplying (providing air from another source). The following is a brief overview of the various types of respirators, to include description and limitations.

AIR PURIFYING RESPIRATORS (APR).

1. Negative Pressure Air Purifying Respirators.

a. General description. The typical negative pressure respirator consists of a half-mask of full facepiece with filters/cartridges specific for the contaminant (gas, vapor, fume, mist, dust, etc.) to be removed. The term negative pressure comes from the fact that a negative pressure is created inside of the respirator due to normal inhalation. The negative pressure is the greatest weakness of this type of respirator because if the face-to-facepiece seal is not good, contaminants will leak into the facepiece without passing through the filter. In addition to the classical respirators described above, there are specific negative pressure respirators that have a combination facepiece and filtering element -- multi-use disposable, and the single use N-95 respirator -- which is primarily used for protection against airborne tuberculosis transmission. Within the particulate respirators, there are nine separate categories as delineated in 42 CFR 84, NIOSH Certification for Respiratory Protection. These consist of three separate filter classes (N, R, and P) at three (3) separate efficiencies (95 percent, 99 percent, and 99.97 percent). The "N" class particulate masks are approved for solid and liquid particulates, excluding oils. The "R" class is both, oil and non-oil, solid and liquid particulates, but has a maximum 8-hour or one shift use restriction when used for oil mists. A "P" class respirator is approved for both oil, and non-oil particulates, and has no time use restriction.

b. A negative pressure respirator cannot be used in an atmosphere that is an Immediate Danger to Life and Health (IDLH).

c. General limitations.

(1) Air purifying respirators do not protect against oxygen-deficient atmospheres.

(2) The maximum contaminant concentration against which an air purifying respirator will protect is determined by the designed efficiency (protection factor), and capacity of the cartridge, canister or filter for the contaminant. The maximum concentration for which the air purifying unit is effective is specified in the OSHA standards. (Respirators do not provide the maximum design protection specified unless the facepiece is carefully fitted to the wearer's face to prevent inward leakage.)

(3) The proper type of canister, cartridge or filter must be selected for the particular atmosphere and conditions. For example, respirators with High Efficiency Particulate Air, (HEPA), cartridges or N-95 respirators do not provide protection against vapors or gases. Conversely, the vapor cartridges do not protect against particulates or bioaerosols.

(4) Air purifying respirators may cause discomfort and objectionable resistance to breathing.

(5) Respirators and facepieces may present special problems to individuals required to wear prescription lenses, because the temple arms may interfere with the face-to-facepiece seal or the glasses may rest on the nose portion of the facepiece.

(6) The life of the filter, cartridge or canister is determined in different ways, such as resistance to breathing, odor because of break-through, number of hours, or an indicator. However, the actual determination will be covered in the job specific training.

2. Powered Air Purifying Respirators (PAPR).

a. General description. Some air purifying respirators are blower operated, and provide air to the facepiece (or hood) under a slight positive pressure. The blower is to assist the user in breathing; however, the air is still filtered air, and not air from another source. This type of respirator is called a Powered-Air-Purifying Respirator. The protection factor for this type of respirator is usually 100-1 percent leakage.

b. General limitations. The limitations that apply to the air purifying respirators apply to the powered air purifying respirators. The primary difference is the greater protection factor with the latter.

AIR SUPPLING RESPIRATORS.

1. Air Line Respirators.

a. General description. An air line respirator for entry into and escape from atmospheres not immediately dangerous to life or health. There are three primary types:

(1) Type A: Provides air by either a hand operator or motor driven motor that takes air from a contamination free area through a large diameter hose having low flow resistance.

(2) Type B: Provides air by a large diameter hose having low flow resistance, and using only the lungs to propel the air form the contamination free area.

(3) Type C: Provides compressed air via either a proper compressor or a bank of tanks. Within the type C, there are demand, continuous flow, and pressure demand valves to control the air flow.

b. General limitations.

(1) The wearer is restricted in movement by the hose or air line, and must return to a respirable atmosphere by retracting the route of entry. The hose of air line is subject to being severed or pinched-off.

(2) The demand type produces a negative pressure in the facepiece on inhalation, and may permit inward leakage of contaminants.

(3) The continuous flow air line respirators also have a limitation caused from over breathing (inhaling more than what the flow is set) thus creating a negative pressure in the facepiece which may permit inward leakage of contaminants.

(4) Continuous flow and pressure--demand air line respirators (positive pressure) are the only airline respirators to be used in atmospheres immediately dangerous to life or health if an auxiliary self-contained air supply is worn to permit escape if the air supply fails.

2. Self-contained breathing apparatus.

a. General description. All completely assembled, portable self-contained devices designed for use as respiratory protection during entry into and escape from, or escape only from, hazardous atmospheres. Use is permissible in atmospheres immediately dangerous to life or health (IDLH).

(1) Closed-circuit. The exhaled air is re-breathed by the wearer after the carbon dioxide has been effectively removed, and a suitable oxygen concentration restored from sources composed of compressed, chemical or liquid oxygen.

(2) Open-circuit. The exhaled air is vented to the atmosphere, and not re-breathed. Within the open-circuit SCBA respirators, there are demand, continuous flow, and pressure demand valves to control the air flow.

b. General limitations.

(1) The SCBA's can be heavy, bulky or both. They have limited service life, and they require extensive training for their safe use and maintenance.

(2) The period over which the device will provide protection is limited by the amount of air in the apparatus, the ambient atmospheric pressure (service life is cut in half by a doubling of the atmospheric pressure), and workload.

(3) Some SCBA devices have a short service life (few minutes) and are suitable only for escape (self rescue) from an IDLH atmosphere.

APPENDIX B
POTENTIAL HAZARDS AND ASSOCIATED RESPIRATORY PROTECTION AT FSH

The respirator requirements listed below represent the minimum. A higher level of protection can always be used.
(f/cc-fibers per cubic centimeter; μg-microgram; mppf-million particles per cubic foot).

Asbestos:

Not in excess of 1 f/cc:	Half facepiece with HEPA filters.
Not in excess of 5 f/cc:	Full facepiece with HEPA filters.
Not in excess of 10 f/cc:	PAPR with HEPA filters/any supplied air respirator.
Not in excess of 100 f/cc:	Full facepiece supplied air operated in the pressure demand mode.
Not in excess of 1000 f/cc: or unknown	Full facepiece supplied air operated in the pressure demand mode with an auxiliary positive pressure SCBA.

Benzene:

Not in excess of 10 ppm: (ppm-parts per million)	Half facepiece air purifying respirator with organic vapor cartridge.
Not in excess of 50 ppm:	Full facepiece air purifying respirator with organic vapor cartridge or full facepiece gas mask.
Not in excess of 100 ppm:	Full facepiece PAPR with organic vapor cartridge.
Not in excess of 1000 ppm:	Supplied air respirator with full facepiece.
Above 1000 ppm or unknown:	SCBA or supplied air with auxiliary self-contained breathing supply.
Fire fighting:	SCBA.
Escape:	Any of the above.

Ethylene Oxide:

Not in excess of 50 ppm:	Full facepiece with EtO approved canister.
Not in excess of 2000 ppm:	Supplied air respirator with full facepiece.

Above 2000 ppm or unknown:	SCBA or supplied air with auxiliary self-contained breathing supply.
Fire fighting:	SCBA.
Escape:	Any of the above.

Formaldehyde:

Not in excess of 7.5 ppm:	Full facepiece with cartridges or canister for formaldehyde.
Not in excess of 75 ppm:	Full-face mask with industrial size canister for formaldehyde. Type C supplied air operated in pressure demand or continuous flow mode.
Above 75 ppm or unknown:	SCBA or supplied air with auxiliary self-contained breathing supply.
Fire fighting:	SCBA.
Escape:	SCBA or full facepiece with industrial size canister.

Lead:

Not in excess of 500 μg/m3:	Half facepiece with HEPA filters.
Not in excess of 1,250 μg/m3:	Loose fitting hood or helmet PAPR.
Not in excess of 2,500 μg/m3:	Half facepiece supplied air respirator operated in the pressure demand mode.
Not in excess of 100,000 μg/m3:	Full facepiece supplied air respirator operated in the pressure demand mode.
Greater than 100,000 μg/m3 or unknown:	Full facepiece SCBA operated in the pressure demand mode.

Lead with mastic remover vapors:

Stacked HEPA filters with organic vapor cartridge.

Nuisance dust:

Not in excess of 500 ug/m3 or 2 mppcf: Dust and mist respirator.

Spray painting:

Outdoors or within a ventilated spray paint booth.
Spray paint respirator (organic vapor cartridge and pre-filter for mists).

Tuberculosis:

Negative pressure respirator with HEPA filter or N-95 particulate respirator.

Chlorine gas:

Self-contained breathing apparatus.

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APPENDIX C
FIT TESTING

Workers must not wear respirators or perform tasks that require respiratory protection when conditions such as a growth, temple pieces on corrective spectacles or goggles, or the absence of one or both dentures prevent a good facepiece-to-face seal.

It is the policy that employees required to wear respiratory protection will be clean shaven. This is in concert with DOD, DA, OSHA, NIOSH, and the majority of the respiratory protection equipment manufacturers.

Respirator fit test procedures.

The following fit test procedure is suitable to determine if an individual can wear a particular respirator. It is a qualitative test, and does not measure the actual level of chemical or particulate penetration of the respirator. It utilizes irritant smoke tubes for particulates involved with HEPA filters and either amyl-isoacetate or saccharin for vapors, gases, etc. Irritant smoke will only be used for HEPA filtered respirators. Other particulate (N95, N90, etc.) will use saccharin. If an employee requires a different type of respirator, the Respiratory Protection Program administrator should be consulted.

Proper fit limitations.

Respirators are generally uncomfortable to wear. If a good facepiece-to-face seal can be obtained only by very tight strap tension, the respirator usually will not be worn for prolonged periods, and its use will be avoided. Even though maximum breathing resistance is specified by NIOSH, there are differences among approved respirators, and one type may be more acceptable to the worker than another. Facial structure varies considerably from one individual to another, and since a given respirator is usually made in only one size, a successful fit cannot always be achieved for all persons. Different sizes of the same model or different models of approved respirators may have to be obtained to provide employees adequate respiratory protection.

Proper fitting of respiratory protective devices for individuals wearing corrective spectacles or goggles is a problem. A proper seal cannot be established if the temple bars or straps extend through the sealing edge of the facepiece. As a temporary measure, spectacles with short temple bars or without temple bars may be taped to the wearer's head. Never wear contact lenses in contaminated atmospheres with a respirator. Systems or kits for mounting corrective lenses inside full facepieces can be purchased with the facepiece. When a individual must wear corrective lenses as part of the facepiece, the facepiece and lenses should be fitted by qualified individuals to provide good vision, comfort, and an effective seal.

Additional factors which can prevent a good facepiece-to-face seal include a growth of beard, sideburns, and the absence of one or both dentures. Prior to administering a fit test, insure the individual is clean shaven, is not wearing spectacles, goggles or contact lenses, and has all dentures in place.

Respirator Fit Test Procedure (Irritant Fume)-HEPA.

1. Let subject smell weak concentration of irritant smoke.

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2. Fit respirator with combination HEPA cartridges.

3. Wear mask for 10 minutes.

4. Perform positive and negative pressure checks.

5. Set up smoke tube (or other testing material).

6. Begin test at 12 inches from facepiece and move to 1 inch of facepiece around mask perimeter.

7. Have subject do the following while inside test hood:

a. Breath normally.

b. Breathe deeply.

c. Turn head from side to side.

d. Nod head up and down, once per second.

e. Read Rainbow Passage aloud and slowly (or recite alphabet or count to 100).

f. Breathe normally.

8. Reject respirator if subject smell fumes.

9. Give sensitivity check for smoke.

10. Perform in well ventilated area.

11. If possible, test two masks different sizes. (Allow individual to select from several masks, different brands, sizes, etc.)

12. Do not test if subject has hair growth between skin and facepiece seal.

13. Repeat annually or when:

a. Weight change of 20 pounds (gain or loss).

b. Significant facial scarring.

c. Significant dental changes.

d. Reconstructive or cosmetic surgery.

e. Any other conditions which may affect the fit.

f. As specified by OSHA or other regulatory authorities.

Isoamyl Acetate Protocol (Banana Oil).

Note: This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit-test particulate respirators, the

respirator must be equipped with an organic vapor filter.

1. Odor threshold screening. Odor threshold screening, performed without wearing a respirator is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

a. Three 1-liter glass jars with metal lids are required.

b. Odor-free water (e.g. distilled or spring water) at approximately 25 Celsius (77 Fahrenheit) shall be used for solutions.

c. The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 milliliter (ml) of pure IAA to 800 ml of odor-free water in a 1-liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.

d. The screening test shall be conducted in a room separate from the room used for actual fit-testing. The two rooms shall be well ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.

e. The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for 2-3 minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only 1 day.

f. A test blank shall be prepared in a third jar by adding 500 cubic centimeters (cc) of odor-free water.

g. The odor test and test blank jar lids shall be labeled (e.g. 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically, and switched to maintain the integrity of the test.

h. The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e. 1 and 2): The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil.

i. The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

j. If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

k. If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

2. Isomayl Acetate Fit Test.

a. The fit test chamber shall be a clear 55-gallon drum liner suspended

inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached. (Note: A commercially available hood may be used as a substitute for the drum liner; however, a sufficient number must be available to preclude cross contamination.)

b. Each respirator used for the fitting and fit-testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.

c. After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit-testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

d. A copy of the test exercises, and any prepared text from which the subject is to read, shall be taped to the inside of the test chamber.

e. Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half, and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel, provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.

f. Allow 2 minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

g. If at any time during the test, the subject detects the banana-like odor of IAA, the test has failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

h. If the test has failed, the subject shall return to the selection room, and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit-test procedure described above. The process continues until a respirator that fits well, has been found. Should the odor sensitivity test have failed, the subject shall wait at least 5 minutes before re-testing. Odor sensitivity will usually have returned by this time.

i. If the subject passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal, and take a breath before exiting the chamber.

j. When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing bag to keep the test area from being contaminated.

k. Repeat annually or when:

(1) Weight changes of 20 pounds (gain or loss).

(2) Significant facial scarring.

(3) Significant dental changes.

(4) Reconstructive or cosmetic surgery.

(5) Any other conditions which may affect the fit.

(6) As specified by OSHA or other regulatory authorities.

Respirator Fit Test Procedure (Saccharin Solution).

1. The saccharin solution aerosol protocol is the only currently available validated test protocol to be used, with particulate respirators less than 99.97 percent efficiency and disposable respirators such as the N-95.

a. Solution preparation. The "taste or threshold check solution" is made by dissolving 0.83 grams of sodium saccharin USP in 1 cc of warm water or adding 1 cc of the commercially prepared fit test solution to 100 cc of distilled water.

b. To prepare the test solution, dissolve 83 grams of sodium saccharin in 1 cc of warm water or use the commercially available solution full strength.

2. Taste threshold screening.

a. The test subject may not eat, drink (except plain water), or chew gum for 15 minutes prior to the test.

b. Without wearing respiratory protection, place the "hood" over the head of the test subject.

c. The test subject shall breathe through his/her wide open mouth with tongue extended.

d. Using the taste check solution, squeeze the nebulizer bulb firmly, and release ten times in rapid succession.

e. Ask the test subject whether the saccharin is tasted.

f. If the response is negative, repeat the test up to a total of three repetitions. If the response still is negative,
the test subject will be required to wear a different type of respirator (HEPA), and be tested by another method (irritant fume).

g. If the test subject tastes saccharin, the threshold testing is complete, and the test subject shall be asked to take note of the taste, and number of repetitions for reference in the fit-test.

3. Fit testing.

a. The test subject may not eat, drink (except plain water), or chew gum for 15 minutes prior to the test.

b. The test subject shall don the respirator, and adjust it to get a good fit.

c. Place the "hood" over the head of the test subject.

d. The test subject shall breathe through his/her wide open mouth with tongue extended.

e. Using the test solution, squeeze the nebulizer bulb firmly and release, in rapid succession, the number of times that was required to elicit a taste response during the taste threshold testing.

f. After generating the aerosol, the test subject shall be instructed to perform the following:

(1) Breathe normally.

(2) Breathe deeply.

(3) Turn head from side to side.

(4) Nod head up and down, once per second.

(5) Read Rainbow Passage aloud and slowly (or recite alphabet or count to 100).

(6) Breathe normally.

g. The aerosol shall be regenerated before beginning exercises (3), (4), and (5) using one half of the number of squeezes.

h. If at any time the test subject indicates that taste is detected, the respirator fit will be deemed inadequate. The test subject may be asked to adjust the respirator, and one additional test trial conducted. If the test subject fails the second test, the test subject will be required to wear a different type of respirator (HEPA or a different manufacturer's N-95).

i. The test will be considered satisfactorily passed if the test subject does not taste saccharin.

j. Repeat annually or when:

(1) Weight change of 20 pounds (loss or gain).

(2) Significant facial scarring.

(3) Significant dental changes.

(4) Reconstructive or cosmetic surgery.

(5) Any other conditions which may affect the fit.

(6) As specified by OSHA or other regulatory authorities.

Rainbow Passage.

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

APPENDIX D
QUALITATIVE RESPIRATOR FIT TEST RECORD

1. Date:_____

2. Name:_____

3. SSN:_____

4. Work Location:_____Telephone:_____

5. Potential Hazard:_____

6. Hazard documented by (supervisor, measurement, policy, OSHA, etc.):_____
_____

7. Respiratory Protection:

   Manufacturer:_____
   Type:_____
   Model:_____
   Cartridge (if applicable):_____
   Size:_____
   NIOSH Approval Number:_____
   Other:_____

8. Fit Test Procedure:

Jogging:_____ Talking:_____ Moving Head:_____

9. Fit Test Material:
Irritant Smoke:_____ Saccharin:_____Amyl-isoacetate:_____

10. Result:
Pass:_____ Fail:_____

11. Comments:_____
_____

12. Testing Official's Signature:_____

D-1

RESPIRATORY PROTECTION TRAINING RECORD

1. Date:_____

2. Name:_____

3. Location of Training:_____

4. Topics covered:

Respiratory Protection Program Elements.

Respiratory Protection Criteria.

Hierarchy of Control.

Types of Respirators.

Air Purifying.

Air Supplying.

Fit Testing.

Function Checks.

Protection Factors, Limitations, Precautions.

Inspection, Cleaning and Storage.

5. Instructor:_____

This training meets the requirements of 29 CFR, section 1910.134, as amended in the Federal Register on

January 8, 1998.

Note: supervisor should post this to the FSH Form 98-E.

APPENDIX E
Respirator Inspection

Item	**Yes**	**No**	**N/A**	**Remarks**
Disposable Respirator				
Straps OK				Elasticity gone, replace
Soiled				If yes, replace
Face piece torn or ripped				If yes, replace
Used				Discard after each use
Half Facepiece, Negative Pressure Respirator				
Face piece torn or ripped				If yes, replace
Harness/straps OK				If elasticity gone, replace
Soiled/Dirty				If yes, clean
Correct cartridges (filters)				If no, see program administrator
Full Facepiece, Negative Pressure Respirator				
Face piece torn or ripped				If yes, replace
Harness/straps OK				If elasticity gone, replace
Soiled/Dirty				If yes, clean

Item	Yes	No	N/A	Remarks
Lens clear and intact				If no, see program administrator
Correct cartridges (filters)				If no, see program administrator
Powered Air Purifying Respirator				
Face piece torn or ripped				If yes, replace
Harness/straps OK				If elasticity gone, replace
Soiled/Dirty				If yes, clean
Lens clear and intact				If no, see program administrator
Correct cartridges (filters)				If no, see program administrator
Battery charged				If no, replace the battery or delay use until the battery is fully charged.
Air Supplied Respirator				
Face piece torn or ripped				If yes, replace
Harness/straps OK				If elasticity gone, replace
Soiled/Dirty				If yes, clean
Lens clear and intact				If no, see program administrator
Airline intact				If no, see program administrator
Tank pressure adequate				If no, see program administrator
Oxygen canister valid				If no, see program administrator
Regulator functioning				If no, see program administrator
Other				

NOTE 1 - The user must have been trained on this type of respirator.
NOTE 2 - For negative pressure respirators, function checks (positive and negative) must be conducted every time the respirator is donned.

APPENDIX F
CLEANING PROCEDURES

Each individual assigned a respirator, that is not a single-use disposable respirator, shall use the following procedures to clean and sanitize the respirator.

After each use:

Clean the respirator with "respirator refresher pads" or equivalent.

*Weekly:

Disassemble the respirator (inspect the components during this disassembly and replace as needed).

Wash the respirator in warm sudsy water using a dish washing soap.

Rinse the respirator in clean water.

Disinfect the respirator in a chlorine bleach solution (either use commercially available disinfectant packages for respirators or two tablespoons of bleach per gall of water) for 2 minutes.

Rinse the respirator thoroughly in clean water.

Place the respirator on a clean cloth, and allow to air dry or dry using a lint free cloth.

After drying is complete, assemble the respirator (re-inspect the components during assembly and replace as needed).

Store in a sealed respirator storage bag or equivalent (zip-lock freezer bag).

*This applies if respiratory protection is routinely used. If not used routinely, then a set schedule must be established.

The proponent of this memorandum is the Directorate of Public Safety. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to the Commander, U.S. Army Medical Department Center and School and Fort Sam Houston, ATTN: MCGA-DPS, Fort Sam Houston, Texas, 78234-5014.

FOR THE COMMANDER:

/S/
MICHAEL F. MERRILL
Director of Information
Management

DISTRIBUTION:
A, B